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Teddy Bear- No Time For Strategy

November 23rd, 2010 | Author: **Ron Lindsey**

Arguably, the most frequent Teddy Bear (i.e. fatuous, rationalizing statements) coveted and expressed by railroaders and suppliers alike is "We have no time for strategy. . . too much going on." As a consultant that focuses on the strategic deployment of technologies aligned with the appropriate changes in the business processes (a.k.a. *strategic railroading*), I have been able to maintain my cool in such conversations by chiming in with "Really?", and with some semblance of respect, I believe. But, what I want to do, really, is reach across the desk and slap the guy silly while calmly screaming "What in the world are you thinking here?" … or … "You need to let go of those next-year's bonus issues for a moment." … or … "So, I guess you don't own, or plan to own, stock in the company?" Granted, I have a self-serving interest in getting this individual to think beyond the horizon of his bonus plan. And, if s/he did so we could have a win-win … Really!

Approaching a railroad or a supplier to talk about technology and process strategies, either individually or ideally together, is not a simple cold-call situation for which I was well trained 40 years ago during my span with IBM. Back then IBM was challenged with getting business executives to understand the value of computers to handle simplistic clerical efforts, e.g., updating inventory, accounts receivables, and processing payroll. Back then, the primary functions didn't change with the use of the computer. The clerks just disappeared. Therefore, any business executive with a clerical workforce was a possible mark for a computer salesperson that could spin business cases. As such, a major part of IBM's training was on how to make and present the business case using real-world adaptations to the principles that the thousands of MBA's that were hired had learned in class. We talked about *inventory turnover, return on investment, internal cost of capital, discounted cash flows, regression analysis*, and even *econometric modeling*. BUT, we didn't talk about changing the underlying business processes beyond that of the back office; we didn't get into the functional operations of the company. The point here is that making a cold-call on an executive back in the 70's was not the same as hitting on Operations management of today that don't understand what technologies can do for their core business processes.

Today, there are four primary challenges to advance railroad operations in sync with a strategic technology plan.

The first challenge is identifying which positions in the individual railroads and across the supplier community would be willing to talk about technology and/or process strategy? Unfortunately, to my knowledge, there is not one position associated with operational (non IT) technologies in any of the railroads or the suppliers that have any form of the Greek root *strategia* in its title. Additionally, as I have pointed out in other postings on this blog, there aren't even *technologists*. That is, while the railroads and suppliers have scores of

technicians that push technologies at any costs, there aren't those individuals that could do so in a pragmatic, cost-effective fashion, with or without modifying the underlying processes to take advantage of what the advancing technologies can do.

The second challenge is that the focus of the Class I railroads to meet the Positive Train Control (PTC) mandate deadline of 12/31/2015 has been the black hole of technicians. They have been totally and reluctantly drawn into the challenge of interoperability, or so it would seem. Actually, what has really happen is that they have willingly escaped into their respective caves to do what they really like to do; design the ultimate technology platform, whether or not it is required. No one is watching, challenging, or redirecting these guys because they are the High Priests of what can has to be done … and no one else really understands, and therefore challenges, the underlying principles of their religion.

The third challenge, therefore, is getting railroad operations management involved so as they will take charge of advancing their railroads via advancing technologies based upon sound business logic that is both pragmatic and cost-effective; business cases that include terms like return on investment, discounted cash flows, regression analysis, etc. Again, there is no position in the railroads currently that could be reasonably charged with this responsibility: It certainly isn't the CIO. What is needed is a *Chief Technologist* or something like that … maybe *Chief Strategic Technologist*, whatever.

Lastly, the fourth challenge is that of involving and evolving the suppliers. With only one exception in the past 2 decades in North America, they have kowtowed to the tactical issues that drive their railroad customers so as to make their bonuses. The bottom-up approach to marketing products and services in the rail industry is a very traditional approach and rightfully so for the past 100 years because the technologies have been, aaahhh … traditional. Now, wireless data offer a paradigm shift in operations, just as IT has evolved over the past 40 years, and to bring the possible advancements to the industry will require top-down marketing. That simply isn't happening today … and probably won't until the PTC issue has subsided sometime after the < 2016 deadline.

The good news is that I am starting to hear rumblings from railroaders and suppliers alike that the PTC interoperability issues are out of control. Indeed, it is possible that perhaps some railroads won't buy into the 220 MHz network as it being the universal wireless data panacea. Indeed, the requirement for a Communications Management Unit **(CMU) on board to handle multiple wireless** paths, as first addressed in my quarterly journal **Full Spectrum** a decade ago, is hopefully being revitalized. Maybe, it never really died in the minds of some, **especially when the 220 MHz network began being slammed down the throats** of several Class I's two years ago.

[Petitioners Note: This, what is noted above, is behind MCLM-SCRAA license and docket proceeding. It is PTC 220 LLC, UP and it other owners, Ed Kemp, Ms. Farquhar et. al. that are slamming this at the FCC: they tell the FCC that grant is "militated" : letter of Ed Kemp in support of motion for interim grant, and see Exhibits A and B by Petitioners to this Motion to Dismiss: they instruct SCRAA that they have so-called "big name" hired "guns" in DC to force FCC to whitewash, overlook, and short-circuit the proceedings on MCLM and its AMTS spectrum defects. This affair is similar to what the same Railroads did quite often to get their rights of way long ago: manipulate-slam government and public sector to get it. It is in the "public interest" as meant in the Communications Act, and it uses misleading tactics before the FCC. Railroads in US are behind the rest of the world. They will not improve by tricks and heavy handed tactics against the the US government including FCC and taxpayers: it backfires ultimately, is not competitive free market, and is not for train safety: If railroads act badly to get to PTC train safety, they are not really trying to be safe in the public interest, but to misuse public- Congress' alarm at their accidents they caused in the first place.]

[This article is also relevant.]

http://strategicrailroading.com/2010/07/a-wealth-of-wireless-missing-opportunities/

A Wealth of Wireless – Missing Opportunities

July 25th, 2010 | Author: **Ron Lindsey**

This is the third of three postings to address the ***Strategic Core Infrastructure*** that is required to advance railroad operations . . . essentially, the technology that is required to pursue ***Strategic Railroading***. Each posting addresses one of the three ***core technologies*** that together comprise the core infrastructure. Whereas the previous two postings addressed **INTELLIGENCE (*The Mobile Node*)** and **POSITIONING (*The Positioning Engine*)**, this posting addresses COMMUNICATIONS.

As recently as 2 years ago, the adage *too-much-of-a-good-thing* would not have seemed appropriate when discussing wireless technologies that could be used by railroads. But since then, the sky has opened up with the expanding availability of commercial wireless networks and most importantly the opportunity to implement trunking in the railroads' extensive 160-161 MHz band that is subjected to the FCC's Refarming Order, a.k.a. narrow-banding. As to the latter, the efficiency of trunking, which dynamically allocates available channels to users (versus the traditional use of dedicated channels, e.g., one channel per yard crew), in concert with the opportunity for a multiple-fold increase in the number of channels obtainable by narrow-banding provides the railroads with an unprecedented amount of capacity to handle both voice and data in even the most complex metropolitan and mainline operations.

Apparently that wasn't enough for most Class I technicians. They wanted more … and more … and so a 220 Mhz band was purchased several years ago that will result in two parallel VHF networks across the industry. The timing was fortuitous it seems, because with the subsequent, and foreseen, PTC mandate that would require a wireless data infrastructure, the 220 Mhz band readily resolved three major challenges for the technicians, albeit with a price tag expected to approach a cool $ Billion. First, the railroad technicians were able to avoid the significant challenge (but a clearly an achievable one with the use of trunking) of reshuffling the channels required for the FCC's refarming mandate. Second, the railroad's technicians once again were handed their most desired type of project, i.e., develop the ultimate wireless communication infrastructure whether it is needed or not. Third, the railroads' technicians finally had a true reason to cooperate in building an industry-based communications platform. Up until the PTC mandate, the "Roadmap to Interoperability", as the technicians referred to their efforts to define conformity across the industry, better represented an etch-a-sketch of numer---ous paths with a roadblock on each since it seemed each major railroad had its individual technical agenda.

There are several key underlying points that are not being considered by Class I technicians or by their management when it comes to the cost-effective deployment

of technologies- most importantly wireless data.

It takes so little data to achieve the majority of the business benefits of advanced operations within a railroad, and across the industry. For example, for U.S. freight railroads the periodicity of train speed and position data required to optimize the use of meet/pass planners is no more frequent than every 5 minutes; NOTE

NOTE PTC does not require extravagant wireless platforms. This is not traffic control;

Either the 160 Mhz with trunking or the sophisticated 220Mhz platform will handle any railroad's requirements.

Railroads could be using commercial cellular and/or the Meteorcomm that they bought into NOW to advance key operating advances. There is no reason to wait for either VHF infrastructure to be advanced. NOTE

Bottom-line: More can be done with less and it can be achieved NOW.

When it comes to implementing and designing for wireless data, the Class I railroads are not considering the railroad's bottom line. What a shame. Hence, my posting on the use of ***Technologists*** in lieu of technicians to build a strategic technology plan in sync with a strategic operating plan, a.k.a. ***Strategic Railroading***.

[Petitioners are leaders in using AMTS and other spectrum for high accuracy location by augmentation of GPS, including on nonprofit basis for US Intelligent Transportation. This is better use of the spectrum then more-of-same two way radio including for PTC. Railroads have other spectrum already secured nationwide suitable for PTC as the writer of these articles explains above. In any case, Raiolroads cannot lawfully launder defects in MCLM AMTS spectrum as they are all-but directly demanding to the FCC, and in any case are effectively attempting. See: www.scribd.com/warren_havens/shelf]

http://strategicrailroading.com/2010/07/the-positioning-engine-changing-railroads-core-technology/

[High Accuracy Location in the US nationwide will be more valuable than the Railroads.

This is shown in some recent studies being completed now.

AMTS is best used for that.

Trimble and APCO lobbied the FCC for 200 MHz range spectrum for this-- for use in RTK for this purpose.

Petitioners are in fact proceeding to do this.]

The Positioning Engine – changing railroad's core technology

July 15th, 2010 | Author: Ron Lindsey

The North American railroads have the opportunity to make a phenomenal paradigm shift in running their operations, both individually and collectively as an industry. However, to date they have failed to recognize the possibilities, yet alone to take a proactive position to break away from ***traditional railroading*** and make the transition to ***strategic railroading***, i.e. syncing strategic operations with a strategic technology plan.

The reasons for such an unfortunate lack of progress are actually quite few but nonetheless difficult to overcome with the railroads' current management teams. In the simplest terms, the reasons reduce to the lack of a true business perspective relative to the deployment of technologies by railroads and suppliers alike. This is due to the lack of ***Technologists*** that can provide cost-effective technology solutions that support operational changes … instead of the current terror of technicians who believe they are driven to deliver the ultimate system, i.e., technology platforms that only they can design.

The shift to *strategic railroading* is based upon making substantial changes in a railroad's ***core technology infrastructure***, i.e., the mixture of communication, intelligence, and positioning technologies. Such changes will eliminate the constraints placed upon operations by the two traditional technologies that have been in use since the early part of the last century, i.e., track circuits and wireless voice. Each of the three technologies that comprise the *core technology infrastructure* will be explored in individual postings with this one addressing the ***positioning*** perspective.

I start this perspective by first looking back to the 80's and 90's to several interesting, not always successful, pursuits of various positioning concepts. At that point, wireless data was beginning to get some facial hair with End-of-Train (EOT) being the first true application of its use across the industry. More importantly, or so it seemed at the time given the hype of the GE-Harris combo, a significant attempt was made by several railroads to advance traffic management. Referred to as Advanced Train Control Systems (ATCS), this platform attempted to incorporate a concept for a positioning technology to ascertain which track a train was on when in parallel track operations, as well as another concept for determining the precision of position along the track required for moving block. Fortunately, the industry soon rejected the two ill-founded concepts, i.e., transponders embedded in tens of thousands of track miles, and expensive, on-board gyro platforms infused with convoluted track databases.

Shortly after the demise of ATCS, I was employed by CSX to develop a Positive Train Control (PTC) system for dark territory operation. A major challenge was to find a

solution for parallel track operation without the availability of track circuits to declare block/track occupancy. Luckily, I had the advantage of what not to do given the ATCS failure. The solution I developed, that has since been used in all PTC pursuits by freight railroads in North America, was to monitor switch position for the back office system to "route" the train within the accuracy of GPS once the initial track was known by PTC. There were significant additional advantages to monitoring switches, i.e., being able to enforce a train should the crew be in danger of violating either the switch's position or run-through speed.

While routing has been incorporated successfully into PTC functionality, there still remains the issues of accuracy and timeliness of positioning data for the purpose of advancing railroad operations. Specifically, what is missing is the middle ground between what the century-old technologies provide and what the technicians left unmanaged with seemingly unlimited capital funds would provide (as is currently the case). The former can only provide block ID, and not actual position or speed of a train in signaled territory. In dark territory, not even that level of information is available. Contrarily, the un-tethered technician will attempt to deliver real time data of both position and speed, even though it clearly isn't necessary. Such fatuous pursuits by technicians result in expensive wireless infrastructures.
There are two key points here -

1) The advanced traffic management systems being deployed in Europe, ERTMS, are using GSM-R wireless with base stations as close as every 4Km so as to insure no more than a 7second lapse in transmitting critical information to keep the high speed trains moving. Such an approach can increase the cost of the wireless infrastructure by a factor of 10 compared to what is required when dealing with slower freight trains.

2) A number of years ago, I contracted an Operations Research (applied mathematics) consultancy to determine the pragmatic requirement for reporting train position and speed in a fashion capable of supporting meet/pass planners. This analysis showed the optimum frequency of reporting such data ranges from reports every 5 – 15 minutes, depending upon the level of traffic. This is not ***real - time*** data, but rather ***in-time*** data; the difference is critical when deploying wireless data infrastructure as well as the design of the back office systems that use the data. With *in-time* data, dispatchers can foresee traffic conflicts and dynamically re-plan train movements; a concept I refer to as ***Proactive Traffic Management*** (PTM) and introduced to the industry 6 years ago.

In addition to the use of wireless to report train position and speed, there is a variety of positioning data that are being provided for singular activities, including OS's, AEI and wayside detection reports. Hence, there is an opportunity to merge these data into a single data base/server that can be used to service all requiring applications with improved timeliness and quality of data. Such capability would be the function of a ***positioning engine*** that is a type of Kalman filter that maintains a

statistically rational tracking of trains based upon a continuously updated data base. I know of only one railroad that has built, reportedly, such a strategic component within their IT infrastructure.

Revving up a positioning engine requires a succession of steps; I can envision the following: 1. Construct a locomotive tracking platform by integrating AEI reports with recurring wireless data transmissions from the locomotives; 2. Incorporate a locomotive-to-train converter to form a train tracking platform; 3. Introduce train OS's from CAD as well as the status of critical manual switches (e.g., dark territory operation) and layer on train routing logic. Voila! You have an IT server that is available for all purposes including the management of traffic, crew, track gangs, and locomotives, as well as PTC. This is an ***enterprise*** solution that, most interestingly, can be provided outboard and independently of the CAD – CTC infrastructure. This is a solution that can stand easily on its own merits without the organizational, technical, and functional barriers that are normally confronted when taking on changes to a railroad's operations practices or its stoic IT infrastructure.

I am not suggesting that the above 3-step process to obtaining a positioning engine is particularly easy. But, it needs to be done now given that the PTC mandate has resulted in the railroads finally working together to develop a wireless strategy, albeit an overly complex and unnecessarily expensive one. Actually there are really two levels of positioning engines required. The first level is required by each railroad, and for a railroad not to do so affects only that particular railroad. The second level of positioning engine is for the industry. What I refer to as ***industry intra-operability*** is a strategic platform that is required to improve the advancement of all railroads. It is the ability to know where assets are regardless of which railroad they are operating. The advantages can be significant, including fueling, maintenance, and traffic management. Industry intra-operability will addressed in a separate posting.

Lastly, positioning data is only as good as the reliability and accuracy of the reference points. This means that the railroads require substantial GIS systems. Fortunately, that seems to be the case for each railroad individually, but not necessarily from an industry standpoint. Furthermore, the GIS platform within a railroad needs to be ***enterprise*** level in concert with the positioning engine. That is, the ***E***-GIS platform needs to be common to all applications requiring such data, and the data collection and modifications requirements need to be specifically assigned to individual departments with no overlap. Simply stated, there can only be one source for any given data element … or … a version of the positioning gateway is required to blend multiple sources of the same data into one usable source. This is a critical design point for safety systems such as PTC.